B. indusiata begins to develop earlier. In the Adirondacks I have collected well-formed capsules in August and September. Prof. C. H. Peck found it mature in October in the Catskills, and Mr. Durand at Ithaca, N. Y. It grows on decaying logs and stumps with other mosses, especially *Georgia pellucida.*

B. Piperi grows on moist banks and on decaying logs, and matures in the fall from August to November, and begins to form the capsules in March, according to Mr. J. B. Leiberg.—*New York Botanical Garden.*

MARCHANTIA AND CONOCEPHALUM.

By William C. Barbour.

The species selected for this opening paper upon the Hepaticae are common everywhere, but are easily mistaken, each for the other. *Marchantia polymorpha* L. here considered, is the only species of the genus which will be found by our readers unless they live in the Southern States. This species is widely distributed in North America, Europe and Asia, and has also been collected in Java and in the Azores Islands.

Conocephalum conicum (L.) Dumort. has practically the range of our Marchantia, with the addition of northern Africa. Both species are found growing on moist earth, though Conocephalum seems partial to damp shaded rocks. The thallus of each is prostrate upon the ground, and when the growth is vigorous, is much overlapped and interlaced.

The thallus of Marchantia is generally once or twice forked, from one to three (rarely more) inches in length, and of a rather peculiar dull green color. The midrib shows very plainly, is quite broad, dark beneath, and bears many root hairs. The surface is areolate, the cells being diamond-shaped and supplied with stomata. The species is dioecious, that is, the male and female

Fig. 1.

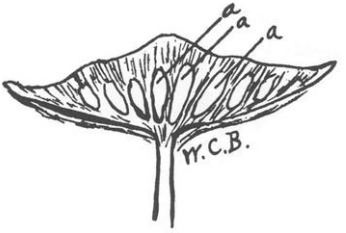

Fig. 2.

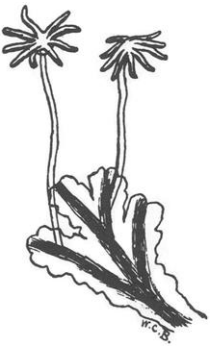

Fig. 3.

receptacles are borne upon separate plants. The male (Fig. 1) receptacle has something the form of a Japanese umbrella, being raised upon a stalk half or three-quarters of an inch above the surface of the thallus, and cut into eight

rounded lobes. On its top are seen a number of papillae. Underneath each papilla, imbedded in the surface of the receptacle, is an antheridium. These antheridia open by small lobes in the papillae. (Fig. 2.)

The female receptacle (Fig. 3) has a much longer stalk (1-2 inches), and is nearly hemispherical in form. It is divided nearly to the centre, thus forming eight or ten rays, under each of which is an involucre. These rays are covered with very fine scales. The involucres are oblong and inclose an ovate perianth. The capsule (sporogonium) is of a light brown color, and when fully developed, extends below the involucre.

In opening it divides into eight short segments, after the manner of some of the orders among the mosses. Beside the spores, the hepatic capsule contains other long, slender bodies, called elaters (Fig. 5), whose office is to aid in

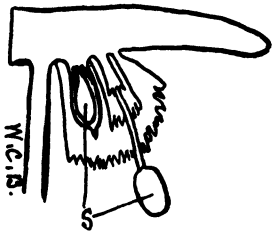

Fig. 4.

Fig. 5.

Fig. 6.

the distribution of the spores. In Marchantia the elater contains two spiral threads running its entire length, and so is said to be "bispiral." The sterile fronds of this species often bear gemmae (Fig. 6) in small cup-shaped receptacles, borne upon the surface of the thallus. The species is in good condition for collecting in late June or early July.

Conocephalum conicum has a thallus several times forked, and varies from yellowish-green to quite a dark shade, but is a brighter green than is Marchantia. The midrib appears narrower, but is quite prominent upon the under side of the thallus. The areolation (Fig. 7, b) is much larger than in Marchantia, is hexagonal instead of diamond-shaped (Fig. 7, a), and has pores so large that they can be easily seen with the naked eye. The antheridia are imbedded in the surface of the

Fig. 7, a.

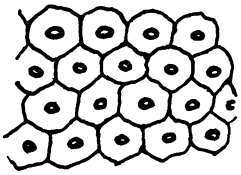

Fig. 7, b.

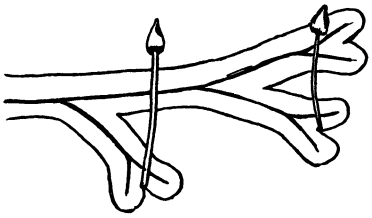

Fig. 8.

thallus instead of a special receptacle. The female receptacle (Fig. 8) is raised

upon a stalk one and one-half or two inches long. The stalk is rather fleshy, and arises from a concave disk at the fork of the thallus. The receptacle is convex, obtuse at the apex, and is cut into six short lobes. Beneath these lobes are the involucres and their capsules, which resemble somewhat those of Marchantia. This species also is dioecious, and has bispiral elaters. It should be collected about the first week in April.

EXPLANATION OF FIGURES.

Fig. 1. Male plant of *Marchantia polymorpha* reduced.
Fig. 2. Section of male receptacle of *M.* magnified; a, a, a, antheridia.
Fig. 3. Female plant of *M.* reduced.
Fig. 4. Section of part of female receptacle of *M. polymorpha* magnified; s, sporogonia, one not yet emerged from perianth. The outer fringe represents the involucre.
Fig. 5. Portion of elater of *M. polymorpha*, showing spiral bands, magnified greatly.
Fig. 6. Sterile thallus with gemmae.
Fig. 7. Cells of thallus, with stomata magnified: a. Marchantia; b. Conocephalum.
Fig. 8. Thallus of *Conocephalum conicum* with female receptacles, reduced.

LICHENS—ALECTORIA, EVERNIA, RAMALINA.

BY CAROLYN W. HARRIS.

(*With Plate IV.*)

In this second article on lichens, *Alectoria*, *Evernia* and *Ramalina* will be considered. They belong to the same family as the Usneas, the *Usneei.*

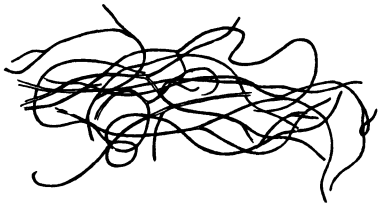

Fig. 1. *Alectoria jubata* var. *implexa* x 1.

In walking along country roads, you no doubt have noticed, on old fences or dead trees, little tufts of "black hair." These are Alectorias. The thallus is fruticose, rather rigid and short, again soft and pendulous. At the joints it is flattened, for the medullary cord is not solid like that of *Usnea*, but is soft and web-like; the flattening at the joints gives greater strength and tenacity to the thallus. Except in color, *Alectoria* resembles *Usnea.* It is not the gray-green of the latter, but varies from light brown to almost black. In only one species is it at all green. The surface has a smooth, shiny appearance, as though it had been varnished. The apothecia are small and sessile ; they are not surrounded by fine fibrils as in *Usnea.* They are usually the same color as the thallus, and have the same shiny appearance.

The most common form of the genus is *Alectoria jubata* L. var. *chaly-*

The magnification of figures 2 and 4 is twice too great, as figures were reduced ½.